



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

### About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

JAPAN No. 1 (1885)

REPORT

MR. TRENCH

RAILWAYS OF JAPAN.

DATED APRIL 10, 1885.

(WITH A MAP.)

*Presented to both Houses of Parliament by Command of Her Majesty.  
August 1885.*

SAL

LONDON:

PRINTED BY HARRISON AND SONS.

For sale by the Author, Mr. Trench, at No. 1, Pall Mall East, London, W.  
Also by Messrs. Harrison and Sons, Printers, at No. 1, Pall Mall East, London, W.  
And by Messrs. Trench and Co., (Limited), at No. 1, Pall Mall East, London, W.  
Price 5d.

Hopkins Transportation Library  
STANFORD UNIVERSITY

JAPAN. No. 1 (1885).

---

# REPORT

BY

MR. TRENCH

ON THE

# RAILWAYS OF JAPAN,

DATED APRIL 10, 1885.

---

(WITH A MAP.)

---

*Presented to both Houses of Parliament by Command of Her Majesty  
August 1885.*

---

LONDON :

PRINTED BY HARRISON AND SONS.

---

To be purchased, either directly or through any Bookseller, from any of the following  
Agents, viz.,  
Messrs. HANSARD, 13, Great Queen St., W.C., and 32, Abingdon St., Westminster;  
Messrs. EYRE & SPOTTISWOODE, East Harding St., Fleet St., and Sale Office, House of Lords;  
Messrs. ADAM & CHARLES BLACK, of Edinburgh;  
Messrs. ALEXANDER THOM & Co. (Limited), or Messrs. HODGES, FIGGIS, & Co., of Dublin.



*Report by Mr. Trench on the Railways of Japan,  
dated April 10, 1885.*

---

WITH A MAP.

---

*Mr. Plunkett to Earl Granville.*

My Lord,

*Tôkiô, April 10, 1885.*

I HAVE the honour to forward herewith the very interesting Report which the Hon. P. Le Poer Trench, Her Majesty's Secretary of Legation, has drawn up on the railways of Japan.

Mr. Trench has taken great trouble to collect and summarize, in a convenient form, a mass of information on a subject of the first importance in the future development of the internal resources of this Empire, and I can bear personal testimony to the care Mr. Trench has taken to verify the various facts which he advances.

I have, &c.  
(Signed) F. R. PLUNKETT.

---

Inclosure 1.

*Mr. Trench to Mr. Plunkett.*

Sir,

*Tôkiô, April 10, 1885.*

I HAVE the honour to transmit to you herewith a Report which I have drawn up on the railways of Japan, to which is annexed a small Map of Central Japan, showing the existing lines of railway, the lines in course of construction, and those in contemplation.

In the preparation of this Report I have received considerable assistance from the information placed at my disposal by the courtesy of Mr. Enouyé Masaru, Director of the Imperial Government Railways, and by the President of the Japan Railway Company, and from the Annual Reports compiled by Mr. Aldrich, the Foreign Secretary of the Government Railway Department.

I have, &c.  
(Signed) P. LE POER TRENCH.

---

Inclosure 2.

*Report by Mr. Trench on the Railways of Japan.*

ALTHOUGH the evident advantages of constructing railways in Japan had for some time occupied the attention of the Mikado's Government, it was not until the years 1868 and 1869 that their deliberations seemed likely to bear any practical result. They met, however, with such strenuous opposition from the large party which always endeavoured to impede any progress towards Western civilization, as well as with other difficulties analogous to those which retarded the introduction of railways into England, that it was only in the year 1870 that, thanks mainly to the persistent and enlightened efforts of Mr. (now Count) Ito, at that time Assistant Vice-Minister of the Home and Finance Departments, and of Mr. Okuma, then Vice-Minister of those Departments, this great step towards the opening up and development of the country was eventually determined on.

It was proposed to construct a railway connecting Yedo and Kioto, the new and old capitals of the Empire, together with a branch line from Yedo to Yokohama, and another from Kioto to Tsuruga, along Lake Biwa, which is the centre of a great traffic, and which branch line would connect the west coast with the two capitals. By means of this latter line the rich crops of the great rice-producing districts were to be placed within easy reach of the metropolitan populations, and the Provinces of Yechizen, Wakasa, and Omi were to be brought into close contact with Kioto and Osaka. Theoretically the scheme was a grand one, but a great obstacle presented itself against putting it into practice, and that was the difficulty of obtaining the necessary capital for carrying it out. It was clear that the construction of so many railways could not be undertaken by the Government without external assistance. It was therefore decided to make an attempt to get the funds abroad, and Mr. H. N. Lay, as Commissioner for the Government, was sent to London to endeavour to obtain a loan of 1,000,000*l*. That gentleman, however, encountered unexpected difficulties from parties in England who had previously led him to count on their readiness to advance the whole of the required sum. He succeeded, nevertheless, in placing the loan on the London market at 98, bearing interest at 9 per cent.

The Japanese Government, however, foreseeing that complications of various kinds were likely to arise from the nature of the powers placed in Mr. Lay's hands, and being also unwilling to pledge their railway receipts and customs duties for a sum of money considerably less than that required to construct the whole of the proposed lines, sent an officer of high rank to England for the purpose of arranging the loan in a different manner: Mr. Lay's commission was revoked, and new arrangements were made affording entire satisfaction to the bondholders. But though Mr. Lay's connection with the construction of the first railway, which was to prove such an unspeakable boon to this country, was thus severed, there can be no doubt that it was chiefly through his instrumentality that a work of such vast importance was determined on and inaugurated. The scheme for making a railway through the centre of Japan had, however, to be abandoned, or, at any rate, postponed, and it was decided only to construct a line between Tôkiô and Yokohama.

#### *Tôkiô and Yokohama Section of the Imperial Railways of Japan.*

This was the first railway constructed in Japan, and connects Tôkiô with Yokohama. It was commenced in 1870, under the supervision of Mr. Morrell, who died in 1872, and was succeeded by Mr. R. Vicars Boyle. The railway is 18 miles long, and, as a single road, was opened for traffic on the 12th June, 1872 (the State opening taking place at Tôkiô on the 12th October of the same year) and was completed as a double line throughout on the 8th May, 1880. The gauge is 3 ft. 6 in., the same as all the other railways in Japan. There are six stations, viz. Yokohama (terminus), Kanagawa, Tsurumi, Kawasaki, Omori, Shinagawa, and Shinbashi (Tôkiô terminus). From Yokohama the line passes for 1½ miles along an embankment constructed across Kanagawa Bay thence to Shinagawa, mostly through wet rice-fields, then by an embankment of 2 miles over the mud flats of Shinagawa, and the last 1½ miles through a portion of Tôkiô to Shinbashi Station, the terminus.

The engineering difficulties were few, the country passed through being very flat, and the heaviest gradient being only 1 in 100 for 1 mile. The largest bridge, over the Rokugo River, near Kawasaki, is constructed of iron, and has six spans of 100 feet each, and twenty-four spans of 44 feet for flood openings. The total cost of the line is said to have been 3,083,672 yen (616,734*l*), or about 34*l* 2*s* 3*d* per mile.

I have been unable to ascertain the various disbursements which have gone to make up the above total, nor can I say whether it includes the amount of compensation given for land inclosed by the railway, though this must have been small, nor the cost of the rolling-stock necessary for starting the line. Preliminary outlay should, however, have been almost *nil* in a country where there are no Parliamentary expenses. Considering, however, that the engineering difficulties were few, and the country traversed flat, the amount expended on the construction of this railway appears to have been needlessly large, especially when compared to the cost of the Kobé, Osaka, Kioto, and Otsu lines; but it must be borne in mind that it was the first railway constructed in Japan, and that, consequently, in the matter of ruinous contracts the Government had to pay dearly for their experience.

TABLE giving the Annual Total Receipts from Passenger and Goods Traffic, from the opening of the line to the 30th June, 1884, and the Working expenses to the 30th June, 1881.

Years ended June 30.	Passenger Traffic.		Goods Traffic.		Total.	Working Expenses.
	Number.	Receipts.	Weight.	Receipts.		
		Yen.	Kin.*	Yen.	Yen.	Yen.
1873 .. ..	1,223,071	395,988	..	..	395,988	117,879
1874 .. ..	1,395,484	403,327	9,121,531	24,590	427,917	239,707
1875 .. ..	1,781,813	413,221	28,160,420	32,823	446,044	246,616
1876 .. ..	1,677,450	379,555	32,198,700	28,210	407,774	217,937
1877 .. ..	1,580,177	349,758	41,714,400	36,238	385,996	265,687
1878 .. ..	1,576,138	357,064	52,157,823	43,568	400,632	293,901
1879 .. ..	1,628,688	376,449	54,218,035	47,178	423,627	234,872
1880 .. ..	1,820,226	428,018	59,725,828	53,533	481,551	252,684
1881 .. ..	2,134,709	502,047	60,766,388	58,182	560,229	283,939
1882 .. ..	2,230,754	515,927	65,903,418	52,994	568,921	Not stated.
1883 .. ..	2,260,760	509,635	61,822,850	46,476	556,111	"
1884 .. ..	2,172,105	491,383	56,912,207	42,253	533,636	"

From the above it will be seen that railroad travelling is as popular with the lower classes in this country as it is with the native population in India. The goods traffic, however, has never been properly developed, but it will doubtless greatly improve now that the branch line from Shinagawa to Kawaguchi has been completed, placing in direct railway communication with the port of Yokohama the rich and fertile country traversed by the Uyeno (Tókiô), Takasaki, and Mayebashi Railroad. Another and a still greater impetus would be given to the goods traffic if the Government were to carry out the project of constructing a pier at Yokohama (connected with the railway by a goods line) where merchant-vessels could load and discharge their cargo.

When the line was first opened all the rolling-stock was got from England, but after a time workshops were established at Shinbashi, where now all the carriages, waggons, &c., are made, but the wheels, axles, and buffers are still imported, and all the engines come from England. The line is very well managed, and should bring in a handsome revenue to the Government, but to ascertain the exact amount is impossible; it is only known to the Japanese officials. The fares are moderate, but more liberality might be shown in the issuing of return tickets, and season tickets would also be a great boon to the large number of people who make constant use of the line. This is the only double line of railway in Japan.

\* 1 kin equal to about  $1\frac{1}{2}$  lbs.

# REVIEW of Rolling Stock on the 30th June, 1884.

	Locomotives.			Carriages.								Waggons.									
	Tank Engines.	Tender ditto.	Total.	State Coach.	First Class.	Second ditto.	Third ditto.	Composite Third and Brake.	Vans, Passenger Luggage.	Carriage Trucks.	Horse Boxes.	Total.	Covered Waggon.	Open ditto.	Cattle Trucks.	Timber ditto.	Fish ditto.	Ballast Waggon.	Goods Brakes.	Casualty Vans.	Total.
June 30, 1883	10	..	10	1	9	14	41	4	8	3	2	82	59	60	3	3	6	16	6	1	154
June 30, 1884	16	..	16	1	9	14	41	4	8	3	2	82	59	60	3	3	6	16	6	1	154
Increase	6	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Decrease	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

## IMPERIAL GOVERNMENT RAILWAYS.

*List of Foreign Staff on the 30th June, 1884.*

Pownall, C. A. W., M.I.C.E., Resident Engineer, Kobé.  
 Wright, B. F., M.I.C.E., Locomotive Superintendent, Kobé.  
 Trevithick, F. H., A.M.I.C.E., Locomotive Superintendent, Tôkiô.  
 Gray, J., Shop Foreman, Tôkiô.  
 Hosking, R., Shop Foreman, Tôkiô.  
 Anderson, J., Foreman Driver, Yokohama.  
 Ward, R., Foreman Driver, Tôkiô.  
 Challons, A., Foreman Platelayer, Tôkiô.  
 Nankivell, G., Shop Foreman, Kobé.  
 Pitts, W., Shop Foreman, Kobé.  
 Hall, J., Running Foreman, Kobé.  
 Horn, R. R., District Foreman, Kioto.  
 Smith, M., District Foreman, Osaka.  
 Page, W. F., Traffic Manager, Kobé.  
 Thorp, R. W., Clerk, Yokohama.  
 Aldrich, A. S., A.I.C.E., Secretary, Yokohama.

*The Kobé and Osaka Section of the Imperial Government Railways.*

This railway, the second constructed in Japar, with a branch line from Osaka to Adjikawa, was completed and opened for the conveyance of passengers on the 11th May, 1874, and for goods traffic on the 1st December of the same year.

Length of line, 22 miles; cost of construction, 4,484,228 yen (747,371*l.*), or about 33,970*l.* per mile.

There are seven stations, viz., Kobé, Sannomiya, Sumivoshi, Nishinomiya, Kansaki, Osaka, and Adjikawa. The Hiôgô (Kobé) terminus, or Kawasaki Station, is situated on the west side of the harbour, and has three lines of rail, and a platform about 300 feet in length. It is also provided with a pier 450 feet long and 40 feet broad, where sea-going ships of 20 feet draft can load and discharge cargo. The railway runs through a very flat country, the incline nowhere exceeding 1 in 100 throughout the line, which crosses all rivers and streams at right angles. A very large outlay was necessary for the construction of three tunnels running under beds of rivers, of many bridges, and of a large number of culverts to facilitate the artificial irrigation which is indispensable for the agriculture of that part of the country. The combined length of these tunnels is 750 feet, and the number of bridges and culverts amounts to 208, besides a large bridge 1,190 feet long, over the Mukogawa.

TABLE giving Receipts and Working Expenses from the opening of the line from the 11th May, 1874, to the 31st December, 1875.

Date.	Passenger Traffic.		Goods Traffic Receipts.	Total.	Total Working Expenses.
	Number.	Receipts.			
		Yen.	Yen.	Yen.	Yen.
1874— May 11 to December 31 ...	505,733	135,449	3,351	138,800	98,298
1875— January 1 to December 31 ..	1,067,868	235,109	16,746	251,855	146,801

*Extension from Osaka to Kioto (27 miles).*

This line was opened for the conveyance of passengers only from Osaka to Mukômachî on the 24th July, 1876, and the remaining 4 miles, to a temporary station (Omiyadôri) on the 5th September of that year, the terminal station at Kioto, a large two-storied brick building with granite dressings, not being quite finished. Goods freight was not carried between Osaka and Omiyadôri during 1876. Cost of construction, 2,817,948 yen (563,589*l.*), or about 20,875*l.* per mile.

There are seven stations, viz., Osaka, Suita, Ibaraki, Takatsuki, Yamasaki, Mukômachî, and Kioto. The most important works on this line are five large bridges over the Iusho, Kansaki, Ibaraki, Oda, and Katsura Rivers, which are all crossed upon wrought-iron girders in 100-foot spans of the Warren type, and consist of five, thirteen, two, one, and twelve of these spans respectively. There are also numerous smaller bridges, culverts, and flood-openings, and the works are generally heavy, consequent on the country passed through being subject to large floods at irregular intervals.

TABLE giving the Receipts and Working Expenses of the Kobé, Osaka, and Kioto Railway for the years 1876, 1877, and 1878.

Year.	Passenger Traffic.		Goods Traffic Receipts.	Total.	Total Working Expenses.
	Number.	Receipts.			
		Yen.	Yen.	Yen.	Yen.
1876 ... ..	1,140,836	273,086	31,544	304,630	233,710
1877 ... ..	1,387,357	394,963	64,496	459,459	260,661
1878 ... ..	1,546,650	444,009	57,926	501,937	261,215

The branch line, 1 $\frac{3}{4}$  miles in length, connecting Osaka Station with the river at Adjikawa was closed on the 30th November, 1877, after having been worked for a period of two and a-half years, it being found that the receipts were altogether insufficient to cover the working expenses.

*Kioto and Otsu Extension (11 $\frac{1}{4}$  miles).*

This line was opened for traffic as far as Otani Station, 8 miles from Kioto, on the 21st August, 1879, and the portion between Otani and Otsu was brought into use after the formal opening of the "Kioto and Otsu section" by His Majesty the Emperor on the 14th July, 1880. Cost of construction, 786,134 yen, or about 157,227*l.* There are seven stations, including the terminus, Kioto, viz., Iuuri, Yamashina, Otani, Baba, Ishiba, and Otsu. Of these, the first three and Ishiba are merely roadside stations. Baba is a depôt for engines and rolling-stock generally, and has arrangements for coaling and watering. At Otsu, the terminal station, there are extensive goods-sheds, several sidings and wharves, and appliances for loading and unloading vessels trading on the lake. A commodious harbour protected by breakwaters has also been constructed. By the completion of this extension railway communication was established between Kobé, Osaka, Kioto, and Lake Biwa, resulting in a steady development of the products and trade of the districts traversed, whilst affording an outlet for produce and merchandize conveyed to Otsu by steamers plying on the lake. On this extension there are forty-eight

bridges and culverts, but the only bridge of any magnitude is the one over the Kamogawa near Kioto, which consists of eight spans crossed by 50-foot girders. The piers and abutments of this bridge are built on brick well foundations; the girders were made in the Kobé workshops. The tunnel through Osaka-yama is 727 yards in length. The gradients are heavy, a great portion of the line being laid out to an inclination of 1 in 40, thus necessitating very powerful engines. All the engines are got from England; a contract for four new ones has lately been given to a Glasgow firm. The iron rails first laid down on the Kobé, Kioto, and Otsu lines are being replaced, as they wear out, by steel. Rails and all raw material, except wood, imported from England.

The Tabular Statement given below shows the annual traffic and receipts upon the Kioto-Kobé and Otsu section of the Imperial Government Railways for the past seven years.

	1878.	1879.	1880.	1881.	1882.	1883.	1884.
Miles open .. ..	47	47	55	58	58	58	58
Passengers—							
First-class single ..	2,850	1,742	2,914	4,031	4,774	5,161	3,881
Second " " ..	31,617	24,807	41,317	60,195	77,326	81,786	62,967
Third " " ..	1,445,400	1,655,300	2,432,198	3,091,787	3,371,547	3,266,149	2,486,568
First-class return ..	..	653	1,726	2,357	3,238	3,970	3,262
Second " " ..	..	12,438	34,713	49,274	68,780	73,430	63,929
Third " " ..	..	..	1,793	11,136	35,638	29,636	13,056
Troops, police, &c. ..	31,575	5,834	8,430	7,120	2,400	1,259	305
At cheap special return fares ..	34,208	119,534	27,203	26,571	14,193	24,010	19,904
Total .. ..	1,545,650	1,820,308	2,550,294	3,252,471	3,577,896	3,484,801	2,653,872
Periodical tickets .. ..	..	..	..	4	2	3	3
Receipts for passengers ..	427,582	491,017	633,037	802,070	858,032	831,445	671,073
Passengers' luggage, parcels, &c.—							
Number of articles .. ..	65,026	72,069	97,825	133,803	163,818	171,896	141,265
Weight .. ..	1,768,735	1,742,083	2,072,044	2,755,285	2,525,765	2,326,387	1,933,069
Amount .. ..	13,727	16,035	18,334	33,853	31,352	29,293	25,134
Mail—							
Amount .. ..	2,700	2,700	2,880	3,279	3,300	3,300	3,300
Total coaching receipts ..	444,009	509,752	654,251	839,202	892,684	864,038	699,507
Goods—							
At ordinary rates—							
Weight .. ..	18,109,841	27,487,504	110,552,433	183,113,211	239,094,662	254,689,555	238,479,888
Amount .. ..	19,554	30,706	56,643	122,779	155,415	161,493	148,725

## JAPAN.

		1878.	1879.	1880.	1881.	1882.	1883.	1884.
<b>Goods (continued)—</b>								
At per truck rates under special agreement—								
Number of waggons ..	..	5,059	4,923	6,056	85	..	..	..
Weight ..	..	21,247,800	20,675,600	25,435,200	357,000	..	..	..
Amount ..	..	18,668	16,771	19,113	221	..	..	..
<b>Mitsui Bishi Company—</b>								
Number of waggons ..	..	10,924	14,924	16,388	15,820	13,956	13,082	11,824
Weight ..	..	45,880,800	62,260,800	68,829,600	66,444,000	58,615,200	54,944,400	49,665,000
Amount ..	..	16,993	22,846	25,255	25,444	22,835	22,243	19,647
<b>Kioto Unyu Kwaisha—</b>								
Number of waggons ..	..	..	..	..	..	..	..	2,312
Weight ..	..	..	..	..	..	..	..	15,536,640
Amount ..	..	..	..	..	..	..	..	8,843
Total tonnage ..	..	88,371,641	110,424,904	204,817,233	249,910,211	297,709,862	309,633,955	303,681,528
Total amount ..	..	57,928	70,323	101,011	148,444	178,250	183,736	172,215
Gross coaching and goods receipts ..	..	501,937	580,075	755,262	987,646	1,070,934	1,047,774	871,722

RETURN of Carriages and Waggon on the 30th June, 1884.

	Carriage Department.												Wagon Department.											
	Imperial State Carriage.	First Class.	Second Class.	First and Second Composite.	Third Class.	Long Bogie Carriages, Third.	50 Passengers Third Class.	Third and Break Composite, Large.	Composite Breaks, Small.	Passenger Luggage Vans.	Horse Boxes.	Carriage Trucks.	Fish Vans.	Total.	Covered Goods Waggon.	Open Goods Waggon.	Cattle Trucks.	Goods Breaks.	Timber Trucks.	Ballast Waggon.	Break-down Van.	Oil Trucks.	Stone Trucks.	Total.
30th June, 1884	1	5	12	11	24	9	86	10	4	14	1	1	10	188	188	115	1	14	16	26	1	1	1	362
30th June, 1883	1	5	14	11	34	9	50	10	4	17	1	1	..	157	195	118	1	9	18	26	1	1	1	370
Increase	..	..	..	..	..	..	36	..	..	..	..	..	10	31	..	..	..	5	..	..	..	..	..	..
Decrease	..	..	2	..	10	..	..	..	..	3	..	..	..	..	7	3	..	..	2	..	..	1	..	8

## RETURN of Engines and Tenders on the 30th June, 1884.

	Number of Engines.		Diameter of Cylinder.	Length of Stroke.	Diameter of Wheel.	Number of Tenders.	
	Year 1884.	Year 1883.				Year 1884.	Year 1883.
(A.) Six-wheel coupled goods engines	4	5	14	22	3	4	5
(B.) Four-wheel coupled bogie engines, large	6	6	15	22	4	6	6
(C.) Four-wheel coupled bogie engines, small	2	2	14	22	4	2	2
(D.) Four-wheel coupled engines, Sharp Stewart's	2	2	15	22	4	2	2
(E.) Tank engines, Sharp's	1	2	13	20	4	..	..
(F.) Tank engines, Stephenson's	..	4	13	20	4	..	..
(H.) Tank engine, four-wheel coupled, Vulcan Foundry	1	1	12	18	4	..	..
(J.) Tank engines, six-wheel coupled, large	3	5	15	22	4	..	..
(K.) Four-wheel coupled, bogie engines, Beyer Peacock's	2	..	15½	22	4	2	..
Total number	21	27	..	..	..	16	15
Increase	..	..	..	..	..	1	..
Decrease	..	..	..	..	..	..	..

(B) Class engines converted from six-wheel coupled goods engines and rebuilt in Kobé Works.

(K) Class engines converted from tank engines received from Yokohama and the new tenders built in Kobé Works.

Six engines of (E) and (F) Classes transferred to Yokohama.

One engine of (E) Class returned from Nagahama. One engine of (A) Class, and two engines of (J) Class, transferred to Nagahama during the last twelve months.

*The Tsuruga and Ogaki Railway (49 miles).*

This line, which connects the northern end of Lake Biwa with the Japan Sea, was commenced on the 6th April, 1880. Cost of construction, 2,895,462 yen, or about 550,000*l.*, which is 522,669 yen less than the original estimate. Dates of the opening of the different sections of the line :—

Tsuruga to Yanagase Tunnel, March 10, 1882.

Yanagase to Nagahama, March 10, 1882.

Nagahama to Sekigahara, May 1, 1883.

Completion of the Yanagase Tunnel, April 16, 1884.

Sekigahara to Ogaki, May 25, 1884.

The surveys and setting out of this line were done by the native cadets taught in the Engineering College at Tôkiô, who received practical training in railroad work on the Kôbê-Kioto Railway. This line it is intended shall form part of the main trunk line following the direction of the Nakasendo, which, when a railway is made from Nagahama to Baba, near Otsu, will ultimately connect the old and new capitals.

The chief work of importance is the tunnel which runs through Yanagase, a hill some 800 feet high, and is 1,400 yards in length, and was four years in course of construction. Its completion now secures the continuity of direct railway communication between the north-west coast of Japan and Lake Biwa, and, by means of the small steamers plying on the lake, with the Otsu, Kioto, Osaka, and Kôbê Railroads.

The works of next importance are two large bridges over the Aigawa and Akazagawa. Where the line runs through a hilly district the gradients are heavy, 1 in 40 being the maximum. There are sixteen stations, viz., Kanagasaki, Tsuruga, Hikita, Yanagase, Nakanogo, Kinomoto, Inokuchi, Takatsuki, Kawage, Odera, Nagahama, Kamisaka, Shunjo, Sekigahara, Tarui, and Ogaki.

**RETURN of Receipts and Working Expenses.**

		Receipts.	Working Expenses.
		Yen.	Yen.
July 14, 1881, to June 1882	..	12,071	5,977
July 1, 1882, to June 1883	..	51,977	34,151
July 1, 1883, to June 1884	..	92,297	61,033
July 1, 1884, to December 1884	..	55,995	50,096

*The Temiya-Sapporo and Poronai Railway.*

This line, which is under the control of the Department of Agriculture and Commerce, is 56½ miles in length, was opened for passenger and goods traffic in November 1880 as far as Sapporo, in June 1882 to Yebetsu, and the whole line was completed in May 1883. Cost of construction, 1,228,452 yen, or about 204,742*l.* This railway, which is the only one in the Island of Yezo, starts from a wooden pier 1,440 feet long by 20 to 40 feet broad (depth of water at the end 21 feet), which runs into the harbour of Temiya (Otarunai), and alongside which vessels can load and discharge cargo, and, passing at the back of the town of Otaru through a tunnel 556 feet in length, reaches Sumiyoshi Station (2 miles). About a mile thence the line approaches the shore, between which and several high cliffs it passes through four tunnels shorter than the first one to Zenibako (11 miles). From this station the line traverses swampy jungle land at

the base of the hills forming one side of Ishikari Valley to Sapporo (22 miles). From Sapporo the line is continued, now through forest, now through swampy land, to Yebetsu (35 miles). The Chitose and Horomui Rivers are crossed, and thence to Tonebetsu River, the country consists chiefly of flat prairie-land. From this point the line trends in an easterly direction to Poronai-buto ( $54\frac{1}{2}$  miles), from which station it passes through a valley and No. 6 tunnel to the Poronai coal-mines ( $56\frac{1}{2}$  miles). The output of coal at these mines is only 150 tons per day, but the manager hopes that this amount may shortly be doubled. The stations at Otaru, Sapporo, Yebetsu, and Poronai are roughly but substantially built, whilst at the remaining places, where the trains stop for a few minutes, there is nothing but an ordinary shed of the poorest description. There is a military station at Yebetsu, and only 4 miles off an Aino settlement. In winter trains have not hitherto run further than Sapporo. The line throughout has been constructed on the lightest and cheapest American system, and can only be looked upon as a temporary one. The bridges and culverts are mostly made of timber, and will have to be replaced by brick and iron. The width of the gauge is 3 ft. 6 in.; the rails are English-made and only 30 lbs. to the yard. The rolling-stock consists of four locomotives, imported from America; five first-class carriages, capable of holding forty-two passengers each; sixteen closed luggage-vans, and thirteen open ones.

The receipts and working expenses for the year ending June 1883 are as follows:—

## RECEIPTS.

					Yen.
Passengers	..	..	..	..	38,465
Goods	..	..	..	..	57,550
Receipts for repairs to	steamer executed at Temiya work-				
shops	..	..	..	..	15,592
Total	..	..	..	..	111,607

## DISBURSEMENTS.

					Yen.
Salaries	..	..	..	..	10,544
Miscellaneous expenses	..	..	..	..	17,873
Workshops	..	..	..	..	20,179
Repairs to line and buildings	..	..	..	..	42,190
Expenses of running trains	..	..	..	..	6,910
Clearing the line of snow	..	..	..	..	2,593
Total	..	..	..	..	100,289

At present there seems very little prospect of any branch lines being made in connection with the above railway, although the advantage of having a line from Sapporo to Mororan (Endermo Bay), a larger and safer harbour than Otarunai, and one considerably nearer to the southern ports of Japan, ought to be apparent to the Japanese. No extension, however, is likely to be made until the Poronai coal-mines are made to yield a larger output.

*The Japan Railway Company.*

The authorized capital of this Company is 20,000,000 yen, divided into 400,000 shares of 50 yen each.

The amount of shares issued on the formation of the Company was 119,314, and at a general meeting of the shareholders held on the 29th January last it was determined to make a further issue of 119,314 shares,

so as to increase the paid-up capital to 11,931,400 yen, and thus enable the Company to proceed with the construction of the several lines they have in contemplation.

*The Uyeno (Tôkiô), Takasaki, and Mayebashi Section of the Japan Railway Company (68½ miles).*

This line was commenced in 1882, and was opened on the 21st October, 1883, as far as Honjo (51½ miles from Tôkiô), to Shinmachi on the 27th of that year, to Takasaki on the 1st May, 1884, and to Mayebashi on the 20th August last. The formal opening of the line to Takasaki by His Majesty the Emperor took place on the 25th June of last year.

Cost of construction, 1,716,637 yen, about 300,000*l.*, but besides this sum a considerable outlay is still necessary for the construction of permanent bridges of iron, with brick and stone foundations, over several rivers of considerable width, hitherto crossed by mere temporary structures of timber.

The cost of one of these bridges is alone estimated at 350,000 yen.

The stations are Uyeno (Tôkiô), Oji, Urawa, Ageo, Konosu, Kumagai, Fukaya, Honjo, Shinmachi, Takasaki, and Mayebashi.

Receipts up to 31st December, 1884, 400,288 yen.

Expenses up to 31st December, 1884, 205,073 yen.

Interest paid on the first issue of shares has been at the rate of 10 per cent. per annum up to 31st December, 1884.

When the actual profits do not exceed 8 per cent. the difference will be made good by the Government.

Cost of rolling-stock, 245,952 yen.

The engines are imported from England, and the rest of the rolling-stock is made at the Government railway works at Shinbashi.

The Company have lately ordered eight locomotive engines from Messrs. Dübs and Co., of Glasgow.

There are no foreigners in the employment of the Japan Railway Company.

*Shinagawa and Kawaguchi Railway (13 miles).*

The Japan Railway Company have, with the consent of the Government, constructed the connecting link between the Tôkiô and Yokohama and Takasaki lines by a line from Shinagawa on the former to near Kawaguchi on the latter. This junction line, branching off from near Shinagawa Station, proceeds by Meguro, Shinjiku, and Itabashi round the outside of Tôkiô, and is expected to greatly develop the goods traffic of both the above-mentioned railways.

Estimated cost of construction, between 400,000 yen and 500,000 yen; actual cost, 351,198 yen, or about 60,000*l.*

The line was opened on the 1st March.

*Accidents and Casualties.*

A serious accident occurred in October 1877 on the Kobé, Osaka, and Kioto line, between Sumiyoshi and Nishinomiya, when a special train came into collision with an ordinary train. The European engine-driver and a Japanese fireman were killed. Another European engine-driver was seriously injured, and a Japanese fireman was badly cut. Fortunately there were very few passengers in the ordinary train, the night being wet and stormy, and the special was returning empty from Kioto, otherwise the loss of life might have been greater.

Ordinary accidents and casualties occur from time to time, as on all lines of railway, but, with the exception of the one above mentioned, there have been none of a very serious nature, and wilful damage to railroad property is happily almost unknown in this country.

### *Rate of Speed attained by Trains.*

The average rate of speed, including frequent stoppages, is 18 miles an hour, but in hilly districts, where the gradients are heavy, it is a good deal less.

### *Lines in course of Construction.*

#### *The Nakasendo Railway.*

When the idea was first entertained of introducing railways into Japan it was proposed to connect the new and old capitals by a railway along the Tokaido. Starting from Tôkiô, the line was to pass by Kanagawa, Odawara, Kambara, Shimada, Okazaki, Miya, or Nagoya, Yokkaichi, Seki, Zeze, and then by Otsu to Kyoto, a distance of over 320 miles. The expense of constructing such a line would, however, have been very great, owing to the inlets of the sea to be crossed, and to the number of large rivers which would have had to be bridged, and which are subject to very heavy floods. The coast-line scheme was therefore given up, and surveys were made for a railway along the Nakasendo, starting from Takasaki—then the proposed terminus of the line constructed by the Japan Railway Company—via Sakamoto, Tanaka, Matsumoto, Tadashi, and Gifu, to Ogaki, a distance of about 213 miles; and for another line from Nagahama, skirting along the south-east of Lake Biwa, to Otsu, which is already connected by rail with Kyoto.

To obtain the necessary capital for the construction of this railway and other lines in contemplation, the Government raised the Nakasendo Railway Loan. The amount authorized by the Imperial Notification of December 1883 is 20,000,000 yen, and bonds to the amount of 15,000,000 yen have already been issued. The nominal price was 90 yen per bond of 100 yen, the interest 7 per cent., and both principal and interest are payable in paper currency. The bonds are open to subscription by foreigners, who may buy, sell, and hold them on their own account in every respect on an equality with Japanese.

No portion of the line is yet finished, but it is expected to be opened very shortly from Ogaki to Gifu, a distance of 8 miles, and at the Takasaki end 18 miles will soon be completed. Expenses of construction, from June 1884 to the end of February last, 997,911 yen.

#### *The Utsunomiya Railway*

is a branch of the Takasaki line at Omiya, near Urawa, to the large town Utsunomiya, on the Oshiu Kaïdo, a distance of about 50 miles, and within 22½ miles of Nikko, celebrated for its ancient and beautiful temples, which are the finest in Japan. Estimated cost of construction, 1,590,000 yen, or about 265,000*l.* The principal stations will be Watsuki, Muribashi, Koga, Oyama, and Ishibashi. The line, with the exception of a large bridge over the Tonegawa, is expected to be completed by July or August of the present year. All the permanent way material, except timber, including iron for the above-mentioned bridge, has been got from England.

### *Osaka and Sakai Railway (8 miles).*

A private Company has been formed for the purpose of laying down a line of railway from Osaka towards the neighbouring town of Sakai. The proposed route, although not long, is a much-frequented one. The line is, I understand, not to pass through the city of Osaka, but to start from the eastern side of the city, the side, namely, nearest to Sakai. For the construction of this line the plant formerly in use at the Kamaishi mines, in Sendai, has been acquired by the Company, and this will be supplemented by two locomotives and a number of carriages which are expected to arrive from Germany in the autumn of this year. It appears that the gauge of this local line is to be different from that of the other lines of railway in Japan. The gauge of the latter is 3 ft. 6 in., while the proposed gauge of the Osaka-Sakai line is 2 ft. 9 in. This is unfortunate, as it will naturally interfere with this local line running in connection with the main lines of railway in the country. The line cannot go quite as far as Sakai on account of the wide Yamatagawa, which would have to be crossed, and to bridge that river would necessitate a very large outlay of money. Surveys of the line have already been made, and it is expected to be completed before the end of the year.

### *Lines in Contemplation.*

The Japan Railway Company propose to continue the line from Utsunomiya, via Shirakawa, Sendai, and Morioka to Awomori, a port in the extreme north, a distance of about 398 miles.

### *Farni to Yokkaichi.*

The Government contemplate making a branch from Farni, on the Ogaki line, to Yokkaichi, a port in Owari Bay, a distance of about 35 miles, or, as an alternative, the construction of the main line to the city of Nagoya, about 20 miles, and a branch from thence to Handa, a port in a small inner gulf within the Bay of Owari, nearer to the entrance, and to the south-east of Nagoya, distant from the latter about 28 miles, which it is thought has greater merits as a place suitable for ships to anchor in a sheltered position, and capable of affording greater facilities for the receipt and discharge of cargo.

The construction of a line from Uyeda, on the Nakasendo trunk line, to Niigata, an open port on the north-west coast, was at one time contemplated, but I learn from the Director of the Imperial Government Railways that it has now been decided to run the line from Uyeda to the port of Imamachi, or Nawoye-tsu, the nearest point on the west coast to the Nakasendo Railway, and about 150 miles south of Niigata. Length of proposed line, about 70 miles.

### *A Railway between Otsu and Nagahama (40 miles).*

The line is already surveyed and staked out, and is to start from Baba, a junction station near Otsu, and skirting along the south-east coast of Lake Biwa is to connect at Nagahama with the Tsuruga and Ogaki line. This railway, however, is not likely to be made till the Nakasendo trunk line is completed, the water communication, as now established, being considered sufficient for the present traffic.

The construction of several other lines by private Companies is said to be in contemplation, but none have as yet been actually decided upon, and as regards more Imperial lines the Director of Railways says that "the intentions of the Government respecting railway extensions being still in their extreme infancy, cannot be definitely put on paper."

It will thus be seen that at the present date there are 265 miles of railway open in Japan, 271 in course of construction, and 543 in contemplation.

*Importance of constructing good Roads throughout the Country.*

In 1882 Mr. Aldrich, the Secretary of the Imperial Government Railways, in his Report to Mr. Enouyé Masaru, the Director of Railways, remarks upon the great and pressing importance of the Government and local authorities turning their attention to the construction and improvement of roads. Roads, he justly observed, are necessary adjuncts to railways. Railways cannot be made everywhere, and to get to, and be able to use, the railways which are made, and being made, *there must be roads*. In support of the remarks made by Mr. Aldrich, the Consulting Engineer, who, having been some years resident in Japan, is competent to express an opinion upon the subject, says: "Mr. Aldrich's remarks as to the construction of ordinary roads are extremely valuable, and I trust that the Government will see their value and act upon them; the inattention hitherto shown to this question is one of the most serious mistakes which has been made. If they would lay out leading lines of road through the country, which could perhaps, with some trifling deviation, be afterwards converted into lines of railway, and also short feeders to these main roads, and to the existing lines of railway, they would be taking an immense step towards the opening up and development of the country." Mr. Aldrich's remarks have already produced some effect; a few new roads have been made, and some old roads improved in several important directions. This is a step in the right direction, and leads one to hope that before long the benefits to be derived from a perfect system of road communication may be conferred on the whole of Japan.

*Map giving Railways in Central Japan.*

The accompanying Map shows existing lines of railway, lines in course of construction, and lines in contemplation, in Central Japan. To give the line in Yezo and the northern portion of the proposed extension to Awomori would have necessitated too large a Map.

As every fresh line of railway which is constructed brings the producing districts into closer communication with the centres of consumption, and thus materially increases Japan's exporting power, it may be interesting to trace briefly what connection exists between the present railway system and the various areas of production.

And in considering this subject it will be convenient to follow the natural division of the railway system into—

1. Existing lines.
2. Lines in process of construction.
3. Lines in contemplation.

*1. Existing Lines.*

The earliest lines of railway which were constructed, namely, those between Tôkiô and Yokohama, and Osaka and Kobé, cannot be said to have had much effect on the producing districts, though they undoubtedly facilitated the exportation of produce after its arrival at the tradal centres of Tôkiô and Osaka. But the establishment of railway connection between the capital and Takasaki, the extension of the Kobé and Osaka line to Kiôto, and the construction of the branch line between that city and Otsu, and of the further branch line between Nagahama and Tsuruga, on the west coast, were works which at once sensibly influenced the distribution of produce.

To begin with the central railways, the provinces through which these lines run are Settsu, Yamashiro, Omi, and Echizen. These are all rich provinces, and produce large quantities of rice, wheat, tea, and tobacco, four of the chief articles of export from Japan, the production of tea being the most noticeable. The line connecting Lake Biwa and Tsuruga is, from a commercial point of view, especially important, as it enables the produce and manufactures of not only Echizen, but the surrounding Provinces of Kaga, Etchin, Echigo, Tango, and Wakasa, such as rice, dried fish, and porcelainware, to be brought direct to the markets of Osaka and Kyoto, whence they are distributed inland and abroad, thus saving the long sea journey from Tsuruga by way of Shimonoseki and the inland sea.

A glance at the Map of Japan will show what a serious obstacle to internal transport is presented by the continuous chain of mountains which traverses the whole length of the main island from north to south. In the absence of a perfected system of roads the transport of produce from the west to the east coast, or *vice versa*, is attended by great difficulties, and as a consequence, goods conveyed between places geographically proximate, but situated respectively on the west and east coasts, have had to be transported by sea. The benefits in this respect which must follow the establishment of railway communication between the two coasts are therefore obvious.

The extension of the railway from the capital to Takasaki and Mayebashi, and its connection with the Tôkiô and Yokohama Railway by means of a loop line between Kawaguchi and Shinagawa, have also been a great boon to producers, the immediate benefits being perhaps even more noticeable than in the case of the central railways. The Takasaki line intersects the important Provinces of Musashi and Joshû, which comprise the largest and richest areas of production in Japan, the principal staples, such as rice, wheat, silk, and tea, being all extensively cultivated.

Mayebashi, the north-east terminus of the line, is the focus of the silk industry for which Joshû is famous, the two provinces together producing more than one-third of the total silk grown in Japan, and Takasaki is the point of transit for all goods passing inland between the capital and the north-west coast. The value of this line to the producer may be estimated from the fact that it has paid a handsome profit to the shareholders from the date of its construction, and that the traffic receipts are increasing rapidly every month.

## 2. Lines in process of Construction.

Of the two lines now in process of construction, that, namely, between Takasaki and Ogaki (known as the Nakasendo Railway) and the one from Omiya, a station on the Ueno-Takasaki Railway, to Utsunomiya, the former cannot be considered to possess much commercial importance, although for administrative and military purposes such a line will undoubtedly be advantageous. The provinces of Shinshû, Hida, and Mino, through which the Nakasendo Railway will run, although two of them are comparatively rich in silk, are for the most part mountainous and thinly populated, and the trade passing through them is at present inconsiderable.

Whatever stimulus this trade may receive later on, there is at present no reason to think that from a commercial point of view the line will be a profitable undertaking until other branch lines connecting the main railway with important seats of industry in outlying provinces have been constructed.

The completion of the other of these two lines, that which is intended to connect Utsunomiya with the capital, will, it may be confidently

anticipated, be attended with the same beneficial results which have been noticed in the case of the Takasaki Railway. Utsunomiya, like Takasaki, is a town of considerable importance, and being situated in a fertile province, and on the high road which extends from Tôkiô northwards to Sendai and Awomori, serves as the principal point of transit for such produce and merchandize as follows the land routes in passing to and from the capital.

### 3. *Lines in Contemplation.*

With regard to the lines of railway in contemplation, the extension of the railroad now in process of construction between Omiya and Utsunomiya to Sendai, and on through Morioka to Awomori, will doubtless have a very important influence on the transport of produce, and on the general development of the internal trade of Japan, in the first place, because the district between Utsunomiya and Sendai, though not so fertile as some other parts of the country, is fairly rich in cereals; and secondly, because the completion of the line beyond Sendai to Awomori may have the effect of opening up hitherto uncultivated districts in the north-east of the main island, which labour under the disadvantage of being shut off from the sea by a barrier of high and rugged mountains. It may also be expected to assist the colonization of Yezo, and the development of its resources, amongst which the fisheries alone are capable of great expansion, although it is of course possible that the immense quantities of dried fish which are annually exported from Yezo may, owing to the bulkiness of the commodity, continue to be transported by sea.

The branch line which it is proposed to build from Tarui, a station close to Sekigahara on the Nakasendo Railway, to Yokkaichi, the principal seaport in the Gulf of Owari, will undoubtedly be of great value to trade. The importance of Yokkaichi, which it owes to its good anchorage and the fact of its being the chief outlet for the producing districts of Owari, Ise, and Iga, has steadily increased during the last few years, and both as a port of import and a port of export it has competed successfully with the Treaty ports of Yokohama and Kobé.

The third line in contemplation is intended to connect the Nakasendo Railway with a port on the west coast, the junction being made at Uyeda in Shinshû. The original idea was to make the open port of Niigata the western terminus of this line. The value to Niigata of a line of railway which would have connected it at once with Kioto and Osaka on the one hand, and the capital on the other, is obvious. Nor would the benefit of such a line have been confined to Niigata alone. For although as an open port Niigata has not fulfilled the expectations which were formed with regard to its future, owing to the absence of a harbour for the protection of shipping, and to the fact of its being cut off, by the central chain of mountains already alluded to, from all intercourse with the east coast, the great natural riches of the Province of Echigo and the position of the town at the mouths of two considerable rivers have enabled it to hold its own against other tradal centres, and to maintain its position, up to the present time, as the chief emporium of trade on the north-west coast of Japan. The establishment, therefore, of railway communication between Niigata and other important centres of commerce would undoubtedly have opened larger markets to the produce of Echigo and the more distant Provinces of Iwashiro, Uzen, and Ugo, and by facilitating the transport of merchandize of all kinds would, there is reason to believe, have stimulated trade generally.

It seems, however, that the absence of any harbour accommodation at Niigata has outweighed other considerations, and has led to the selection

of the town of Imamachi, or Nawoye-tsu, the nearest point on the west coast to the Nakasendo Railway, as the western terminus of this branch line. Imamachi lies at the mouth of the Sekigawa, and is about 150 miles south of Niigata. The harbour is said to be small, but as a port of call for vessels of small tonnage engaged in the coasting trade it offers facilities for the transshipment of produce which Niigata does not possess.

(Signed) P. LE POER TRENCH.

Tôkiô, April 10, 1885.

---

Inclosure 3.

*Map of Central Japan, showing the Route for the Main Trunk Lines of Railway between Tôkiô (Yedo), Kioto, and North Coasts.*

---







STANFORD UNIVERSITY LIBRARIES  
CECIL H. GREEN LIBRARY  
STANFORD, CALIFORNIA 94305-6004  
(415) 723-1493

All books may be recalled after 7 days

DATE DUE

F/B JUN 30 1994

AUG 14 1994

Stanford University Library  
Stanford, California

We would like to inform you that the book which  
you have borrowed is available for use at the  
other libraries.

REPORT

MR. TRENCH

RAILWAYS OF JAPAN,

DATED APRIL 10, 1885.

(WITH A MAP.)

---

*Presented by both Houses of Parliament by Command of Her Majesty.*  
*August 1885.*

---

LONDON:

PRINTED BY HARRISON AND SONS.

To be purchased, either directly or through any Bookshop, from any of the following  
Messrs. HARRISON, 18, Great Queen St., W.C., and 22, Abchurch Lane, London; or  
Messrs. FINE & SPENCER, 100, Strand, W.C., and 11, Pall Mall, London; or  
Messrs. ALLEN & LANE, 10, Bedford Square, London; or  
Messrs. WATKINS & Co. (Limited), 10, Market Street, Dublin.